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EXAMINER	
LEE, JOHN W	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/765,122	YAMAUCHI ET AL.	
	Examiner	Art Unit	
	John Wahnkyo Lee	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20040128 and 20050316*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. An initialed and dated copies of Applicant's IDS form 1449, Paper No. 20040128 and 20050316, are attached to the instant Office action.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.

The clause regarding "willful false statements ..." required by 37 CFR 1.68 has been omitted.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3, 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. For further examination, the examiner will consider claims 3, 8 and 9 are dependent claims of claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1,12, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katto (US 6,111,979) in view of Levoy et al. (US 6,097,394), and further in view of Gormish et al. (US 5,659,631).

Regarding claim 1, Katto discloses a texture image compressing device (Figs. 1-3, 5, 7) comprising: a separating unit configured to separate intensity maps including intensity values and light source-independent texture images including color components from a plurality of texture images corresponding to a plurality of different light source directions and a plurality of

different viewpoint directions (Fig. 21; col. 5, lines 49-57); a compressed texture generating unit configured to generate compressed textures by combining the compressed intensity maps, the representative intensity maps, the light source-independent texture compressed images (Figs. 1-15,3-37, 5-55, 7-77, "MULTIPLEXING MEANS"; abstract). However, Katto does not disclose or teach the other claim limitations, "an intensity map compressing unit ..." and "a light source-independent texture image compressing unit ..." Instead of Katto, Levoy teaches an intensity map compressing unit configured to compress the intensity maps to generate compressed intensity maps and representative intensity maps that are codebooks of the compressed intensity maps (Fig. 11; col. 12, lines 32-47). Gormish discloses a light source-independent texture image compressing unit configured to compress the light source-independent texture images to generate light source-independent texture compressed images and color component conversion tables that are codebooks of the light source-independent texture compressed images color component conversion tables that are codebooks of the light source-independent texture compressed images (Figs. 1 and 2; abstract, "color planes").

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Levoy's invention and Gromish's invention in Katto's system to provide a image-based rendering technique, which is robust and allows much more freedom in the range of possible views (Levoy; col. 3, lines 6-10), and improved compression of palettized image data (Gromish, col. 2, lines 19-20).

Regarding claim 12, Katto discloses A texture image decompressing device comprising (Figs. 3, 4, 6, and 8): a compressed texture input device inputting a compressed texture into which a plurality of texture images corresponding to respective a plurality of different light source directions and a plurality of different viewpoint directions have been compressed (Figs

22 and 23; col. 5, lines 58-65; col. 8, lines 39-47); a data extracting unit configured to extract, from the compressed texture, compressed intensity maps corresponding to the inputted viewpoint direction and light source-independent texture compressed images corresponding to the inputted viewpoint direction (Figs. 2-18, 4-38, 6-58, 8-78, 13-130, 18-133, "DEMULTIPLEXING MEANS"; col. 7, lines 23-38; col. 7, lines 63-67; col. 9, lines 22-43; col. 11, lines 38-47; col. 12, lines 18-30; col. 13, lines 32-39); a texture image generating unit configured to generate the decompression target texture image by using the light source-independent texture images and the intensity components (Figs 22 and 23; col. 5, lines 58-65; col. 8, lines 39-47; col. 7, lines 23-38; col. 7, lines 63-67; col. 9, lines 22-43; col. 11, lines 38-47; col. 12, lines 18-30; col. 13, lines 32-39). However, Katto does not disclose or teach the other claim limitations- "a light source/viewpoint direction ... ", "a conversion table extracting unit ...", "a light source independent texture image extracting unit ... ", and "an intensity component computing unit ..." Instead of Katto, Levoy teaches a light source/viewpoint direction input device inputting a viewpoint direction and a light source direction of a decompression target texture image (Figs. 8 and 10; col. 8, lines 18-36; col. 11, lines 12-27) and an intensity component computing unit configured to compute intensity components of the decompression target texture image by using the representative intensity maps and the compressed intensity maps (cols 13, lines 48-67; col. 14, lines 1-67). Gormish teaches a conversion table extracting unit configured to extract, from the compressed texture, representative intensity maps and color component conversion tables (col. 2, lines 35-43).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Levoy's invention and Gromish's invention in Katto's system to provide a image-based rendering technique, which is robust and allows much more freedom in

the range of possible views (Levoy; col. 3, lines 6-10), and improved compression of palettized image data (Gromish, col. 2, lines 19-20).

Regarding claims 14 and 15, claims 14 and 15 are analogous and correspond to claim 12. See rejection claim 12 for further explanation.

8. Claims 2-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katto (US 6,111,979) in view of Levoy et al. (US 6,097,394), and further in view of Gormish et al. (US 5,659,631), Namizuka (US 2002/0126313), and Woodell et al. (US 2003/0072496).

Regarding claim 2, Katto, Levoy, Gormish discloses all the previous claim limitations except the normalizing unit and the intensity map correction image compressing unit. However, Woodell teaches adjusting the intensity value, which can be a process of normalization, (Figs. 1-14 and 2-14; page 3, paragraph [0035]) and Namizuka discloses the gamma correction (page 3, paragraph [0026]) and a correction process using a correction table (Fig. 5; page 3, paragraph [0031]).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Levoy's invention, Gromish's invention, Namizuka's invention, and Woodell's invention in Katto's system to optimize image data to produce a high-quality image (Namizuka; page 1, paragraph [0003]) and to provide a method of improving a digital image in terms of the image's dynamic range compression, color independence from the spectral distribution of the scene illuminant and color/lightness rendition (Woodell; page 2, paragraph [0014]).

Regarding claim 3, Katto further discloses images obtained by a multi-view point generating intensity maps, area maps, velocity maps, and depth maps (Fig. 21; col. 5, lines 49-57).

Regarding claims 4 and 5, Levoy further teaches that a light field is built that allows 360 degrees of azimuthal viewing to accomplish using a planar gantry involving acquiring four slabs each providing 90 degrees (col. 10, lines 11-14). Levoy also teaches that either the gantry or the object must be rotated to each of four orientations spaced 90 degrees apart in order to acquire a 360-degree light field in four 90-degree segments using a planar gantry (Fig. 10; col. 11, lines 5-15).

Regarding claim 6, Woodell further teaches that the filter (Figs. 1-14 and 2-14) convert the intensity I'(x,y) to a digital value between 0 and 255 (page 3, paragraph [0035]).

Regarding claims 7-9, Levoy further teaches vector quantization as a first stage of the compression pipeline (Fig. 11; col. 12, lines 50-67; col. 13, lines 1-30).

Regarding claim 11, claim 11 is analogous and corresponds to claims 1 and 2. See rejections of claims 1 and 2 for further explanation.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katto (US 6,111,979) in view of Levoy et al. (US 6,097,394).

Regarding claim 10, Katto discloses a texture image compressing method (Figs. 1-3, 5, 7) comprising obtaining a plurality of first images and a plurality of second images, from a plurality of texture images, corresponding to a plurality of light source directions and a plurality of viewpoint directions, respectively, the plurality of first images including intensity values dependent on the light source directions, the plurality of second images including color components not dependent on the light source direction (Figs. 20-21; col. 5, lines 40-57) and generating compressed textures where the first and second compressed texture images and the first and second codebooks are combined (Figs. 1-15, 3-37, 5-55, 7-77; "MULTIPLEXING

MEANS"; abstract). However Katto does not teach or disclose the other claim limitations, " compressing the first images to generate first compressed texture images and first codebooks that are information for decompressing the first images from the first compressed texture images" and "compressing the second images to generate second compressed texture images and second codebooks that are information for decompressing the second images from the second compressed texture images," but Levoy teaches an intensity map compressing unit configured to compress the intensity maps to generate compressed intensity maps and representative intensity maps that are codebooks of the compressed intensity maps (Fig. 11; col. 12, lines 32-47).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Levoy's invention in Katto's system to provide a image-based rendering technique, which is robust and allows much more freedom in the range of possible views as suggested by Levoy (col. 3, lines 6-10).

10. Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katto (US 6,111,979) in view of Levoy et al. (US 6,097,394), and further in view of Gormish et al. (US 5,659,631) and Namizuka (US 2002/0126313).

Regarding claims 13 and 16-17, Katto, Levoy, and Gormish disclose all the previous claim limitations except the detail claim limitations of claims 13 and 16. However, Namizuka discloses the gamma correction (page 3, paragraph [0026]) and a correction process using a correction table (Fig. 5; page 3, paragraph [0031]).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Levoy's invention, Gromish's invention, and Namizuka's invention

in Katto's system to optimize image data to produce a high-quality image (Namizuka; page 1, paragraph [0003]).

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levoy et al. (US 6,097,394) in view of Gormish et al. (US 5,659,631), and further in view of Woodell et al. (US 2003/0072496).

Regarding claim 18, Levoy discloses a computer-readable medium having stored thereon a data structure for storing a compressed texture into which a plurality of texture images corresponding to a plurality of different light source directions and a plurality of different viewpoint directions have been compressed (Fig. 8,11, 14A-D; col. 18, lines 33-51) the data structure comprising and the identifier representing the viewpoint direction (col. 13, lines 48-67; cols. 14, lines 1-67; "(u,v,s,t)"). However, Levoy does not disclose or teach the other claim limitations. Instead of Levoy, Woodell teaches adjusting the intensity value, which can be a process of normalization, (Figs. 1-14 and 2-14; page 3, paragraph [0035]), and the filter (Figs. 1-14 and 2-14) convert the intensity I'(x,y) to a digital value between 0 and 255 (page 3, paragraph [0035]). Gormish teaches a conversion table extracting unit configured to extract, from the compressed texture, representative intensity maps and color component conversion tables (col. 2, lines 35-43).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Gromish's invention and Woodell's invention in Levoy's invention to provide a method of improving a digital image in terms of the image's dynamic range compression, color independence from the spectral distribution of the scene illuminant and color/lightness rendition (Woodell; page 2, paragraph [0014]) and to provide improved compression of palettized image data (Gromish, col. 2, lines 19-20).

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katto (US 6,111,979) in view of Levoy et al. (US 6,097,394), and further in view of Gormish et al. (US 5,659,631), Namizuka (US 2002/0126313), Woodell et al. (US 2003/0072496), and Gossett et al. (US 6,333,743).

Regarding claim 19, Katto discloses a computer-readable medium having stored thereon a data structure for storing a compressed texture into which a plurality of texture images corresponding to a plurality of different light source directions and a plurality of different viewpoint directions have been compressed, the data structure comprising (Figs. 20-22; col. 5, lines 40-65). However, Katto does not disclose or teach the other claim limitations- "a compressed intensity map field …", "a light source-independent texture …", "an intensity map correction …", "a representative intensity map field …", "a color component conversion table field …", "a scale/bias conversion table field…", "an identifier field …" Instead of Katto, Woodell teaches a compressed intensity map field including compressed intensity maps in which normalized intensity maps have been compressed, the normalized intensity maps having been obtained by normalizing intensity components of the texture images (Figs. 1-14 and 2-14; page 3, paragraph [0035]) and a representative intensity map field including representative intensity maps for decompressing normalized intensity maps from the compressed intensity maps (Figs. 1-14 and 2-14; page 3, paragraph [0035]); Gormish teaches alight source-independent texture compressed image field including light source-independent texture compressed images in which color components of the texture images have been compressed (Figs. 1 and 2; abstract, "color planes") and a color component conversion table field including color component conversion tables for decompressing color components from the light source-independent texture compressed images (Figs. 1 and 2; abstract);

Namizuka teaches an intensity map correction compressed image field including intensity map correction compressed images in which intensity map correction images for decompressing intensity components from normalized intensity components have been compressed (Fig. 5; page 3, paragraphs [0026]-[0031]) paragraph [0031]);

Gossett teaches a scale/bias conversion table field including scale/bias conversion tables for decompressing intensity map correction images from intensity map correction compressed images (Fig. 4-405; col. 3, lines 13-25);

Levoy teches an identifier field including identifiers representing viewpoint directions, wherein the compressed intensity maps, the light source-independent texture compressed images and the intensity map correction compressed images are identified by the identifiers (col. 13, lines 48-67; cols. 14, lines 1-67; "(u,v,s,t)").

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use Gromish's invention, Woodell's invention Levoy's invention, Namizuka's invention, and Gossett's invention in Katto's system to provide a image-based rendering technique, which is robust and allows much more freedom in the range of possible views (Levoy; col. 3, lines 6-10), and improved compression of palettized image data (Gromish, col. 2, lines 19-20), to optimize image data to produce a high-quality image (Namizuka; page 1, paragraph [0003]), and to provide a method of improving a digital image in terms of the image's dynamic range compression, color independence from the spectral distribution of the scene illuminant and color/lightness rendition (Woodell; page 2, paragraph [0014]).

Conclusion

13. No claims are allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Wahnkyo Lee whose telephone number is (571) 272-9554. The examiner can normally be reached on Monday - Friday (Alt.) 7:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JINGGE WU
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(AU 2624)